**Supplementary Material**

# **Appendix 1**

Appendix 1 Table 1: Full output from the global model of mangrove tree height vs. restoration stage.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Random intercept** | | |  |  |
| **Group** | **Variance** | **Std. Dev** |  |  |
| Site | 0.067 | 0.259 |  |  |
| **Fixed effects** | | | | |
| **Treatment** | **Estimate** | **Std. Error** | **z value** | **P-value** |
| Negra Forra | - | - | - | - |
| Intercept (Y0.5) | 3.99 | 0.21 | 19.10 | <0.001 |
| Y1 | 0.07 | 0.24 | 0.29 | 0.772 |
| Y2 | 0.77 | 0.24 | 3.15 | 0.002 |
| Y3 | 1.10 | 0.28 | 3.94 | <0.001 |
| Y4 | 1.91 | 0.26 | 7.41 | <0.001 |
| Y5 | 2.21 | 0.28 | 8.04 | <0.001 |
| Mature mangrove | 2.78 | 0.25 | 10.93 | <0.001 |

# **Appendix 2**

Appendix 2 Table 2: Full output from the global model of mangrove DBH vs. restoration stage.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Random intercept** | | |  |  |
| **Group** | **Variance** | **Std. Dev** |  |  |
| Site | 0.087 | 0.296 |  |  |
| **Fixed effects** | | | | |
| **Treatment** | **Estimate** | **Std. Error** | **z value** | **P-value** |
| Negraforra | - | - | - | - |
| Intercept (Y0.5) | 1.77 | 0.28 | 6.32 | <0.001 |
| Y1 | 0.13 | 0.32 | 0.41 | 0.679 |
| Y2 | 1.03 | 0.317 | 3.24 | 0.001 |
| Y3 | 1.46 | 0.34 | 4.3 | <0.001 |
| Y4 | 2.03 | 0.32 | 6.28 | <0.001 |
| Y5 | 2.32 | 0.33 | 7.02 | <0.001 |
| Mature mangrove | 2.74 | 0.31 | 8.6 | <0.001 |

# **Appendix 3**

Appendix 3 Table 3: Full output from the global model of overall gastropod abundance vs. restoration stage.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Random intercept** | | |  |  |
| **Group** | **Variance** | **Std. Dev** |  |  |
| Site | <0.001 | <0.001 |  |  |
| **Fixed effects** | | | | |
| **Treatment** | **Estimate** | **Std. Error** | **z value** | **P-value** |
| Intercept (Negraforra) | 1.09 | 0.31 | 3.52 | <0.001 |
| Y0.5 | 0.28 | 0.52 | 0.54 | 0.583 |
| Y1 | -1.60 | 0.47 | -3.36 | <0.001 |
| Y2 | 1.34 | 0.37 | 3.62 | <0.001 |
| Y3 | 0.93 | 0.60 | 1.57 | 0.114 |
| Y4 | 1.60 | 0.46 | 3.45 | <0.001 |
| Y5 | 2.30 | 0.56 | 4.04 | <0.001 |
| Mature mangrove | 0.88 | 0.44 | 2.03 | <0.05 |

# **Appendix 4.1**

Appendix 4.1 Table 4: Full output from the global model of *Melampus* abundance vs. restoration stage.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Random intercept** | | |  |  |
| **Group** | **Variance** | **Std. Dev** |  |  |
| Site | <0.001 | <0.001 |  |  |
| **Fixed effects** | | | | |
| **Treatment** | **Estimate** | **Std. Error** | **z value** | **P-value** |
| Intercept (Negraforra) | 0.87 | 0.44 | 1.98 | <0.05 |
| Y0.5 | 0.22 | 0.75 | 0.29 | 0.76 |
| Y1 | -1.68 | 0.63 | -2.65 | <0.01 |
| Y2 | 1.13 | 0.53 | 2.13 | <0.05 |
| Y3 | 0.22 | 0.90 | 0.24 | 0.80 |
| Y4 | -2.66 | 1.20 | -2.21 | <0.05 |
| Y5 | -23.62 | 50362 | 0 | 0.99 |
| Mature mangrove | -22.67 | 19128 | -0.001 | 0.99 |

# **Appendix 4.2**

Genus-specific global model output tables: *Vitta.*

Appendix 4.1 Table 5: Full outputs from the global models of *Vitta* genus abundance vs. restoration stage.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Random intercept** | | |  |  |
| **Group** | **Variance** | **Std. Dev** |  |  |
| Site | 1.09 | 1.04 |  |  |
| **Fixed effects** | | | | |
| **Treatment** | **Estimate** | **Std. Error** | **z value** | **P-value** |
| Intercept (Negraforra) | -2.79 | 1.32 | -2.10 | <0.05 |
| Y0.5 | 2.09 | 1.63 | 1.23 | 0.21 |
| Y1 | 4.63 | 1.56 | 0.29 | 0.76 |
| Y2 | 2.74 | 1.45 | 1.89 | 0.05 |
| Y3 | 3.21 | 1.64 | 1.95 | 0.05 |
| Y4 | 3.54 | 1.51 | 2.33 | <0.05 |
| Y5 | 4.16 | 1.60 | 2.59 | <0.01 |
| Mature mangrove | -2.31 | 1.50 | 0 | 0.99 |

# **Appendix 4.3**

Genus-specific global model output tables: *Littoraria.*

Appendix 4.3 Table 6: Full outputs from the global models of *Littoraria* genus abundance vs. restoration stage.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Random intercept** | | |  |  |
| **Group** | **Variance** | **Std. Dev** |  |  |
| Site | 0.02 | 0.16 |  |  |
| **Fixed effects** | | | | |
| **Treatment** | **Estimate** | **Std. Error** | **z value** | **P-value** |
| Intercept (Negraforra) | -0.70 | 0.55 | -1.27 | 0.20 |
| Y0.5 | -0.21 | 0.97 | -0.22 | 0.82 |
| Y1 | -17.29 | 1885.4 | -0.009 | 0.992 |
| Y2 | 1.39 | 0.61 | 2.25 | <0.05 |
| Y3 | 0.70 | 0.95 | 0.74 | 0.45 |
| Y4 | 0.51 | 0.78 | 0.65 | 0.51 |
| Y5 | 1.69 | 0.85 | 1.97 | <0.05 |
| Mature mangrove | 1.99 | 0.66 | 2.98 | <0.01 |

# **Appendix 4.4**

Genus-specific global model output tables: *Cerithideopsis.*

Appendix 4.4 Table 7: Full outputs from the global models of *Cerithideopsis* genus abundance vs. restoration stage.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Random intercept** | | |  |  |
| **Group** | **Variance** | **Std. Dev** |  |  |
| Site | 0.81 | 0.90 |  |  |
| **Fixed effects** | | | | |
| **Treatment** | **Estimate** | **Std. Error** | **z value** | **P-value** |
| Intercept (Negra Forra) | -21.75 | 1412 | -0.002 | 0.99 |
| Y0.5 | -10.05 | 23275 | 0 | 1 |
| Y1 | -9.25 | 76593 | 0 | 1 |
| Y2 | 20.10 | 14120 | 0.001 | 0.99 |
| Y3 | 21.30 | 14120 | 0.002 | 0.99 |
| Y4 | 23.46 | 14120 | 0.002 | 0.99 |
| Y5 | 24.46 | 14120 | 0.002 | 0.99 |
| Mature mangrove | 22.64 | 14120 | 0.002 | 0.99 |

# **Appendix 4.5**

Genus-specific global model output tables: *Thaisella.*

Appendix 4.5 Table 8: Full outputs from the global models of *Thaisella* genus abundance vs. restoration stage.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Random intercept** | | |  |  |
| **Group** | **Variance** | **Std. Dev** |  |  |
| Site | <0.001 | <0.001 |  |  |
| **Fixed effects** | | | | |
| **Treatment** | **Estimate** | **Std. Error** | **z value** | **P-value** |
| Intercept (Negra Forra) | -16.79 | 990.26 | -0.01 | 0.98 |
| Y0.5 | -2.85 | 5906 | 0 | 1 |
| Y1 | -5.57 | 12045 | 0 | 1 |
| Y2 | -5.57 | 12045 | 0 | 1 |
| Y3 | -2.22 | 5590 | 0 | 1 |
| Y4 | -3.21 | 6447 | 0 | 1 |
| Y5 | -2.22 | 5590 | 0 | 1 |
| Mature mangrove | 16.50 | 990 | 0.01 | 0.98 |

# **Note for Appendix 4:** Some p-values exceeded the 0.05 threshold; hence, these results should be interpreted as indicative trends rather than conclusive evidence.

# **Appendix 5**

**Table 9.** Output from assessment of correlations between environmental factors (tree height and DBH) with the principal NMDS axes.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Structural variable** | **NMDS1** | **NMDS2** | **R2** | **P-value** |
| Tree height | -0.9168 | 0.3993 | 0.2604 | 0.001 |
| DBH | -0.9472 | 0.3207 | 0.3034 | 0.001 |

# **Appendix 6**

**Table 10.** Output from assessment of differences in community composition across restoration stages with PERMANOVA.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Source** | **Df** | **Sum of Squares** | **R²** | **F-value** | **P-value** |
| **Restoration stage** | **7** | 2307.4 | 0.399 | 5.98 | 0.001 |
| **Residuals** | **63** | 3474.8 | 0.601 | - | **-** |
| **Total** | 70 | 5782.2 | 1.000 | **-** | **-** |